



PATENT COOPERATION TREATY

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference PH-21532-PCT | FOR FURTHER ACTION See Form PCT/IPEA/416 | |
| International application No. PCT/KR2004/000374 | International filing date(day/month/year) 24 FEBRUARY 2004 (24.02.2004) | Priority date (day/month/year) 09 JUNE 2003 (09.06.2003) |
| International Patent Classification (IPC) or national classification and IPC IPC7 H01L 33/00 | | |
| Applicant POSTECH FOUNDATION et al | | |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>4</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____ containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> | | |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p> | | |
| Date of submission of the demand 06 JANUARY 2005 (06.01.2005) | Date of completion of this report 27 SEPTEMBER 2005 (27.09.2005) | |
| Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140 | Authorized officer KIM, Dong Yup Telephone No. 82-42-481-5749  | |

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/000374

Box No. 1 Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☒ This report is based on translations from the original language into the following language English which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☒ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☒ the international application as originally filed/furnished
- ☐ the description:
- pages _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the drawings:
- pages _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/000374

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|------------|-----|
| Novelty (N) | Claims | 1-15 | YES |
| | Claims | NONE | NO |
| Inventive step (IS) | Claims | 7-8, 14-15 | YES |
| | Claims | 1-6, 9-13 | NO |
| Industrial applicability (IA) | Claims | 1-15 | YES |
| | Claims | NONE | NO |

2. Citations and explanations (Rule 70.7)

(1) The documents cited in the International Search Report are as follows:

D1 : KR 2003-85272 A D2 : JP 2003-73859 A D3 : WO 94/00885 A1
D4 : JP 2003-45661 A D5 : JP 2000-31462 A

(2) Novelty

The subject-matter of claims 1-15 is considered to be new under PCT Article 33(2).

(3) Inventive Step

Claims 1-6

The subject-matter of claims 1-6 is about a contact fabric using a heterostructure of metal/semiconductor nanorods comprising: semiconductor nanorods; and metals deposited on semiconductor nanorods wherein there is a low contact resistance ohmic characteristic or a rectifying Schottky characteristic between the nanorods and the metals.

D2 discloses a regularly arranged nano-structure(7) joined on the substrate(1). The substance forming the nano-structure such as TiO₂ or ZnO can develop photocatalyst characteristics when absorbing at least ultraviolet radiation or the ultra-violet of sun light. The regularly arranged nano-structure is obtained on the substrate, which has a morphology such as nanotube, nanodot, nano drill rod, nano fiber, and nano wire. (the abstract, figures 1, 2 of D1)

D3 discloses a light emitting device incorporating a layer of porous silicon of low dimensionality surmounted by a discontinuous layer of silver in the form of discrete islands. A digitated electrode is connected to the islands, and the islands have diameters in the range of 5 nm to 20 nm and spacings in the range of 10 nm to 50 nm. They form a Schottky diode structure on the silicon. (the abstract of D2)

Therefore, the technical features of claims 1-6 are already disclosed in D2 and D3 in a similar field of application, or are included among several straightforward possibilities or combinations from which the skilled person could select without the exercise of inventive skill.

-continued-

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

BOX V.

Claims 9-13

The subject-matter of claims 9-13 is about a method for manufacturing a contact fabric using a heterostructure of metal/semiconductor nanorods. The method comprises a step for making a nanorods, and a step for depositing metals on the nanorods, wherein there is a low contact resistance ohmic characteristic or a rectifying Schottky characteristics between the nanorods and the metals.

D2 discloses a manufacturing method of a regularly arranged nano-structure joined on the substrate. The substance for forming the nano-structure, the size and the distribution of nanorods, the substance of electrodes, and the characteristic of nanorods are disclosed in D2.

D3 discloses a manufacturing method of a light emitting device incorporating a layer of porous silicon of low dimensionality surmounted by a discontinuous layer of silver in the form of discrete islands. A digitated electrode is connected to the islands, and the islands have diameters in the range of 5 nm to 20 nm. The nanorods form Schottky diode structures on the silicon.

Therefore, the features of 9-13 are already disclosed in D2 and D3 in a similar field of application, or are included among several straightforward possibilities or combinations from which the skilled person could select without the exercise of inventive skill.

Consequently, the subject-matter of claims 1-6, 9-13 lacks an inventive step under PCT Article 33(3)

Claims 7-8 and 14-15

The subject-matter of Claims 7 and 14 is about a contact fabric and a method for manufacturing a contact fabric containing Au or Pt layer formed on the metal layer.

And the subject-matter of Claims 8 and 15 is about a contact fabric which is heat treated for the development of the electrical characteristic and a method for manufacturing a contact fabric containing an extra heat treatment step.

But none of the documents D1-D5 refer to the above-mentioned technical features.

Consequently, the subject-matter of claims 7-8 and 14-15 is believed to have an inventive step under PCT Article 33(3).

(4) Industrial Applicability

The subject matter of Claims 1-15 is considered to be industrially applicable under PCT Article 33(4).